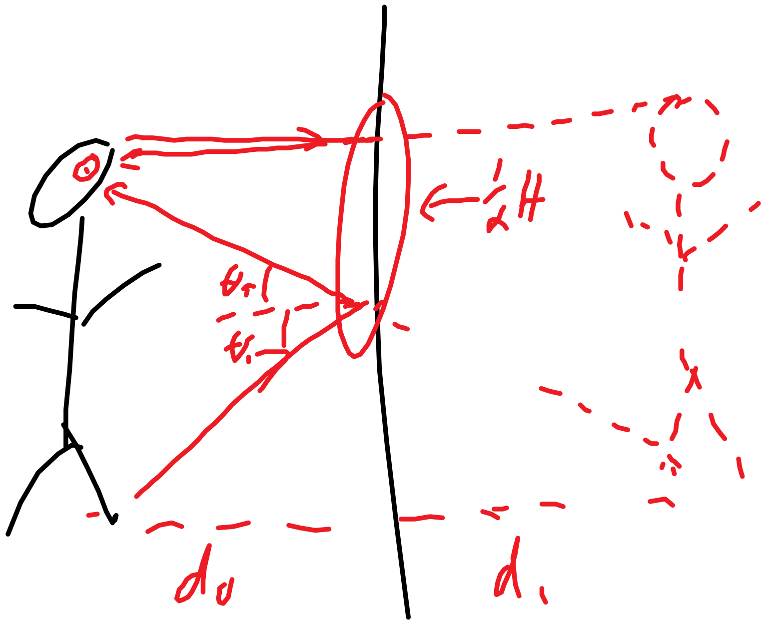
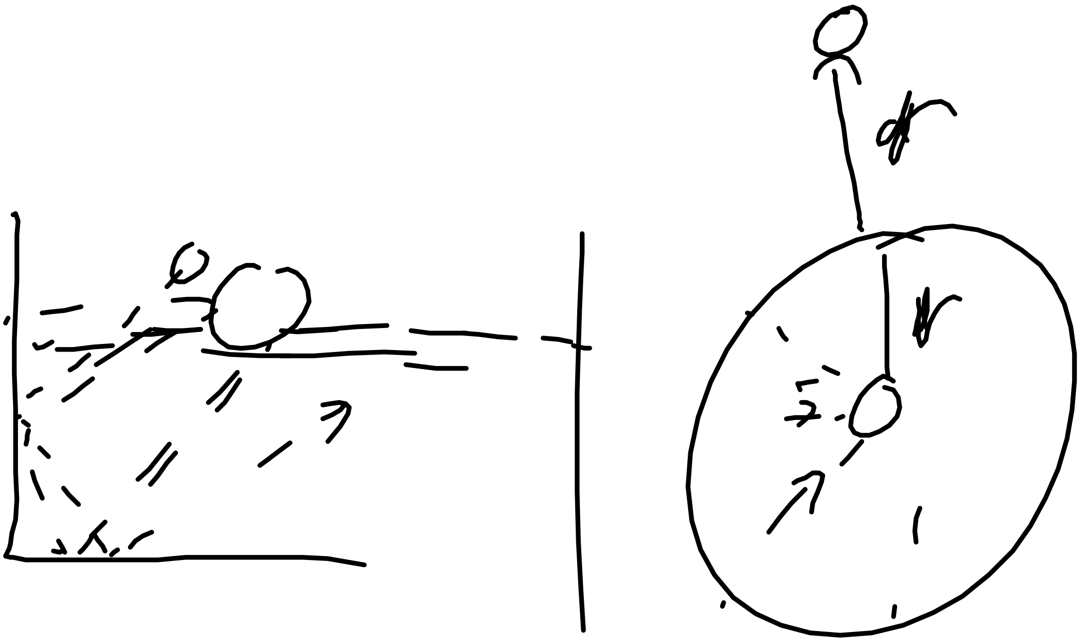
Q19 p 853





2f

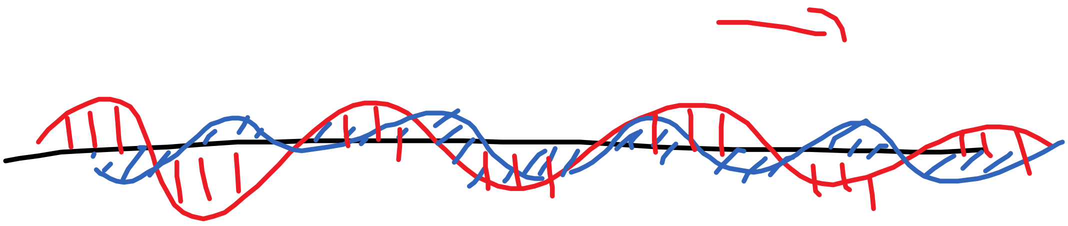
$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

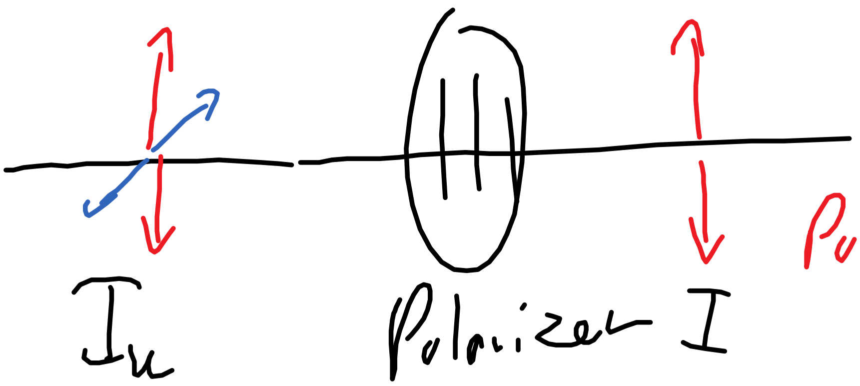
$$M = -d_o$$

$M = -\frac{dv}{dt}$

\\]
[''']///

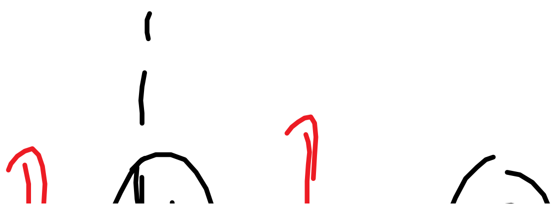
Light

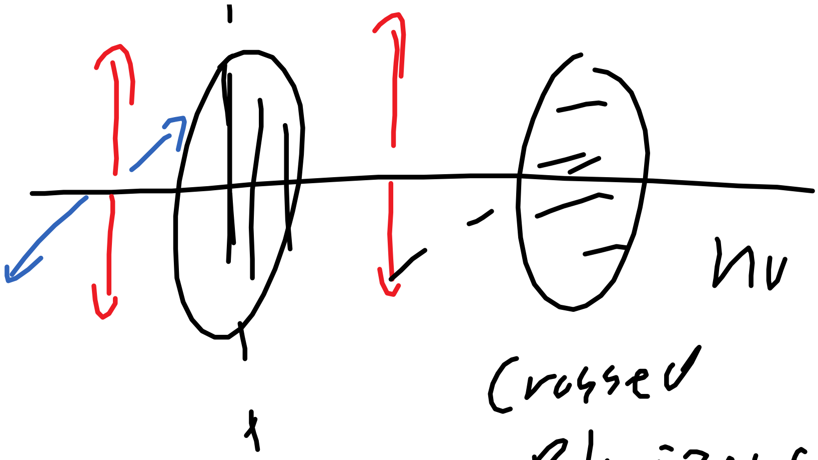




Polarized light

Intensity is reduced by $I = \frac{1}{2} I_0$





by $I = \frac{1}{2} I_0$

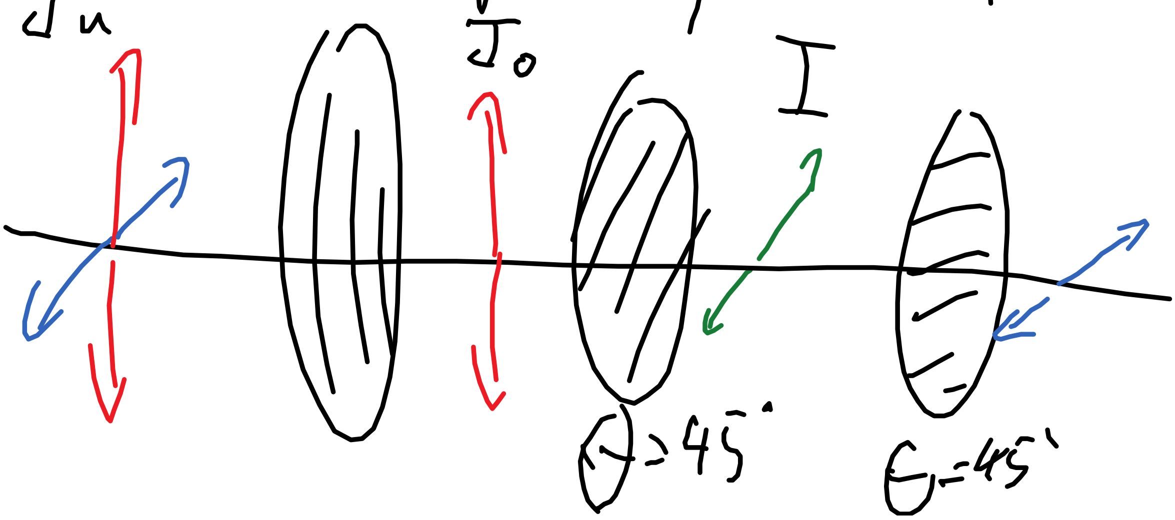
no light

crossed polarizers

angle between the two polarizers is θ, if $\theta = 90^\circ$, no light goes through

If another polarizer is put between the crossed polarizers, light goes through!!

Wow, weird.



$$I = I_0 \cos^2\theta$$

I_u is the intensity of unpolarized light, old unit is candelas, cd but Watts/metre squared (Hecht uses I_o)

I_o is the polarized light = $1/2I_u$
(Hecht uses I_1)

I is the intensity of light through the second polarizer making an angle θ to the first polarizer.

eg. Sunlight with intensity 1.0 kW/m^2 is incident on 3 polarizers at 45º to each other. Determine the intensity of the light after each polarizer.

After the first polarizing lens,
$I = 1/2I_u = 0.50$ kW/m^2

After the second polarizer
$I = I_o\cos^2\theta = 0.50\text{x}\cos^2(45) =$
0.5x(Cos(45))^2=0.25 kW/m^2

After the third polarizer
$I = I_o\cos^2\theta = 0.25$x(Cos(45))^2
=0.125 kW/m^2

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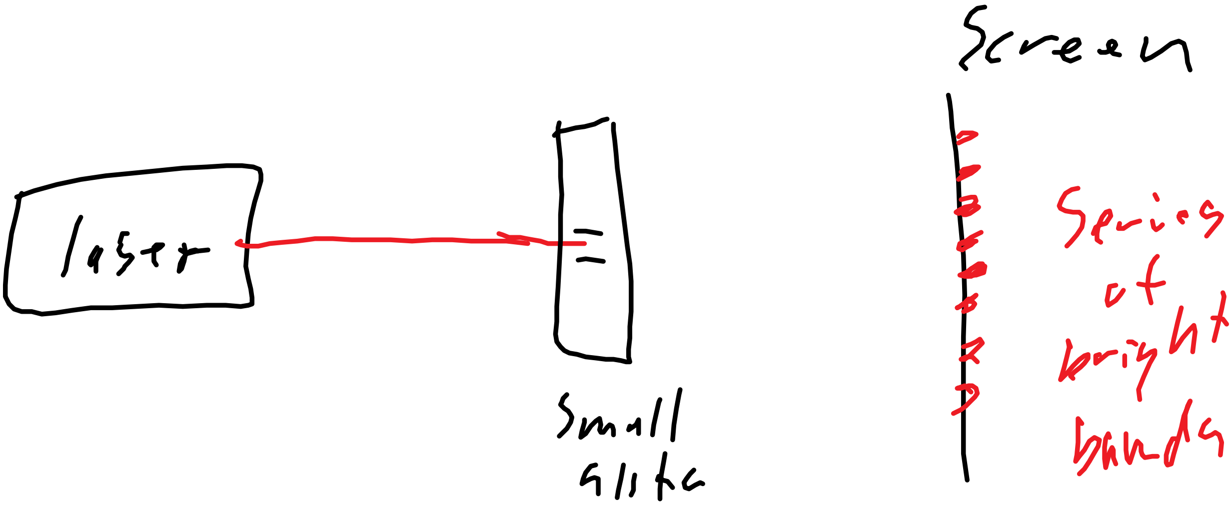
Old curriculum - Brewster's angle - light reflected off a material with index of refraction n, will be partially polarized by $\tan\theta = n_t/n_i$ transmitted medium incident medium
polarized sunglasses are great for cutting down glare off water/snow

Young's Double Slit/Source Interference

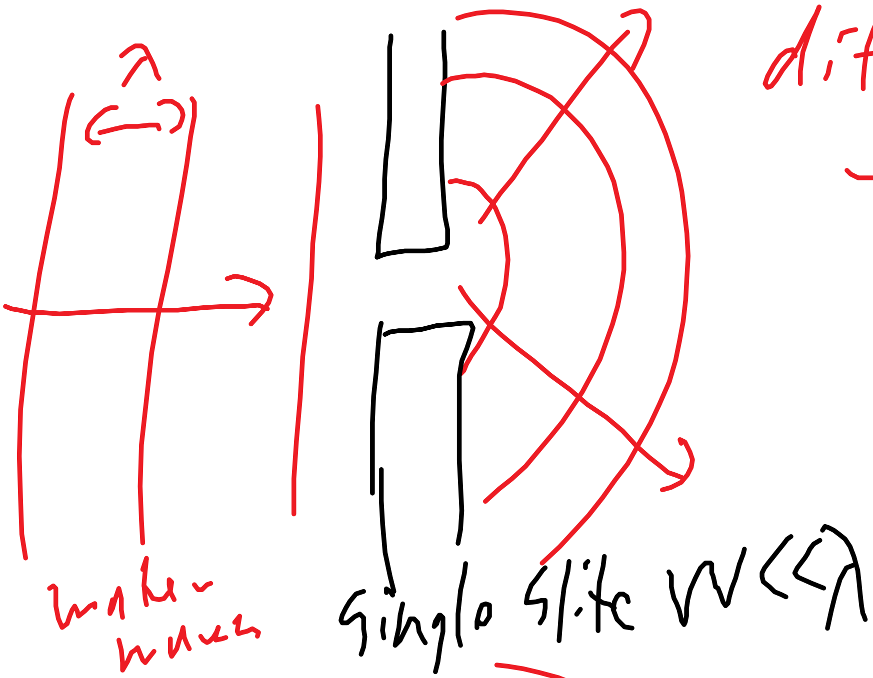
Newton did many optics experiments - light through a prism and came up with the corpuscle theory of light-Light is particles.

Young set out to disprove the particle theory of light by shining light through 2 very small slits



What's the deal?

λ diffraction



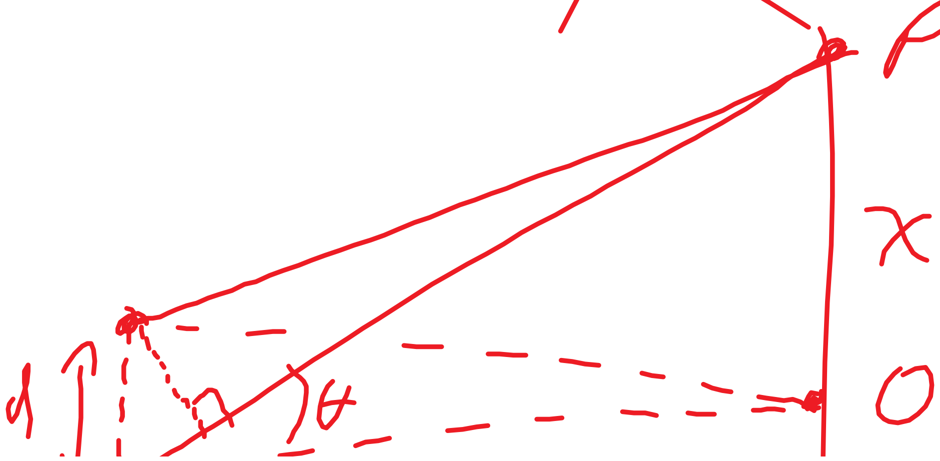
diffraction

- waves spread around barriers
- depends on λ

↑λ = ↑diffraction

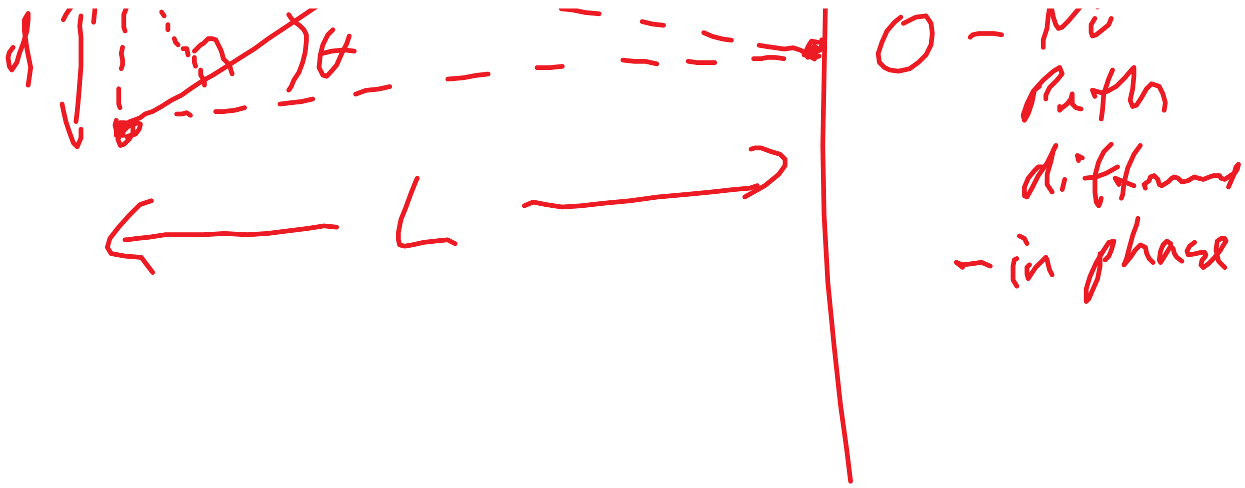
Peak on trough = destructive interference

Peak on Peak = constructive interference



P - in phase

O - No Path


d
θ
L
O - No
Path
difference
- in phase